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10/518,127	07/25/2005	Caiguo Gong	2002B094	6723
23455	7590	09/15/2008	EXAMINER	
EXXONMOBIL CHEMICAL COMPANY			PEPTONE, MICHAEL F	
5200 BAYWAY DRIVE				
P.O. BOX 2149			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,127	GONG ET AL.	
	Examiner	Art Unit	
	MICHAEL PEPITONE	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 May 2008.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-3,5,9-11,14,16,19,20,22,23,29-32,36-38,40,42,45,73 and 74 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-3,5,9-11,14,16,19,20,22,23,29-32,36-38,40,42,45,73 and 74 is/are rejected.
- 7) Claim(s) 29 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____ .	6) <input type="checkbox"/> Other: _____ .

DETAILED ACTION

Claim Objections

Claim 29 is objected to because of the following informalities: Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. One acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being “selected from the group consisting of A, B and C.” See Ex parte Markush, 1925 C.D. 126 (Comm'r Pat. 1925) [See MPEP 2173.05(h)].

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5, 9-11, 14, 16, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elspass *et al.* (US 5,807,629) in view of Patil (US 5,498,673), when taken with Li *et al.* (US 6,060,549).

Regarding claims 1-3, 5, and 9-11: Elspass *et al.* teaches a nanocomposite (1:5-7) comprising clay {layered materials, which can be modified with swelling agents (exfoliated)} (2:33-63) and an elastomer comprising copolymers of isobutylene [instant claim 5] and functionalized paramethyl styrene [instant claims 2-3, and 9-10] (2:10-17), wherein the nanocomposite has sufficiently low air permeability to be useful as a tire inner liner (1:60-67).

Elspass *et al.* does not teach a monomer functionalized with groups (I-V) of instant claim 1. However, Patil teaches copolymers of isoolefins and para-alkylstyrenes (1:5-6) functionalized with an R₄ moiety corresponding to instant groups (I-V) {R¹ = h, x = 2-10, y = 0-20} [instant claim 1] (1:29-2:38). Patil disclose a copolymer of isobutylene and para-methylstyrene, which contained 15 wt% of para-methylstyrene and the remainder of isobutylene, wherein the copolymer was functionalized (2:65-4:49), wherein the functionality with para-methylstyrene was uniformly distributed over the entire molecular weight range [instant claim 11] (4:37-49). Elspass *et al.* and Patil are analogous art because they are concerned with a similar technical difficulty, namely the preparation of copolymers of isoolefins and functionalized para-alkylstyrenes. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined the para-alkylstyrenes functionalized with R₄ groups, as taught by Patil in the invention of Elspass *et al.*, and would have been motivated to do so since Patil suggests that such groups have particular utility in forming polymer blends (1:58-59) and is an

equivalent alternative means of providing copolymers of isoolefins and functionalized para-alkylstyrenes.

The Office realizes that all the claimed effects or physical properties are not positively stated by the reference. However, the reference teaches all of the claimed reagents. Therefore, the claimed effects and physical properties, i.e. a permeation coefficient of less than 7 mm·cc/(m²·day·mmHg) at 40 °C [instant claim 1], would implicitly be achieved by a composition with all the claimed ingredients. If it is the applicants' position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties and effects with only the claimed ingredients.

Li *et al.* provides evidence that layered clay materials, when intercalated by treatment with swelling agents, affords a layered silicate that can more readily sorb polymeric material between the layers, thereby providing a uniform dispersion of the exfoliated layers within the polymer matrix (6:25-7:49).

Regarding claim 14: Elspass *et al.* teaches clay in an amount of 0.1 to 80 wt% of the nanocomposite (3:3-7).

Regarding claim 16: Elspass *et al.* teaches carbon black (4:50-51).

Regarding claim 19: Elspass *et al.* teaches a secondary rubber {polybutadiene rubber} (3:32-46).

Regarding claim 20: Elspass *et al.* teaches an inner tube (3:29-31).

Claims 22-23, and 29-32, 36-38, 40, 42, 45, and 73-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elspass *et al.* (US 5,807,629) in view of Patil (US 5,498,673), when taken with Li *et al.* (US 6,060,549).

Regarding claims 22-23, and 29-32, and 36-37: Elspass *et al.* teaches a method for preparing a nanocomposite (1:5-7) comprising contacting clay {layered materials, which can be modified with swelling agents (exfoliated)} (2:33-63) with an elastomer comprising copolymers of isobutylene [instant claim 31] and functionalized paramethyl styrene [instant claim 30 and 36] (2:10-17), and a grafting a promoter {curing package} (4:54-57) [instant claim 22], wherein the elastomer is first contacted with the functionalizing compound (2:18-32), followed by contacting with the clay and melt blended [instant claim 23] (3:10-30; 5:65-6:27).

Elspass *et al.* does not teach a method utilizing the functionalizing compounds listed in instant claims 22 and 29. However, Patil teaches copolymers of isoolefins and para-alkylstyrenes (1:5-6) functionalized with anhydrides, acylhalide, or lactones, specifically acetyl chloride [instant claim 22] and maleic anhydride [instant claim 29] (1:29-2:38). Patil disclose a copolymer of isobutylene and para-methylstyrene, which contained 15 wt% of para-methylstyrene and the remainder of isobutylene, wherein the copolymer was functionalized (2:65-4:49), wherein the functionality with para-methylstyrene was uniformly distributed over the entire molecular weight range [instant claims 32 and 37] (4:37-49). Elspass *et al.* and Patil are analogous art because they are concerned with a similar technical difficulty, namely the preparation of copolymers of isoolefins and functionalized para-alkylstyrenes. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined the functionalizing compounds {yielding R₄ groups}, as taught by Patil in the invention of Elspass *et al.*

al., and would have been motivated to do so since Patil suggests that such functionalizing compounds {yielding R₄ groups} have particular utility in forming polymer blends (1:58-59) and is an equivalent alternative means of providing copolymers of isoolefins and functionalized para-alkylstyrenes.

The Office realizes that all the claimed effects or physical properties are not positively stated by the reference. However, the reference teaches all of the claimed reagents. Therefore, the claimed effects and physical properties, i.e. a permeation coefficient of less than 7 mm·cc/(m²·day·mmHg) at 40 °C [instant claim 23], would implicitly be achieved by a composition with all the claimed ingredients. If it is the applicants' position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties and effects with only the claimed ingredients.

Li *et al.* provides evidence that layered clay materials, when intercalated by treatment with swelling agents, affords a layered silicate that can more readily sorb polymeric material between the layers, thereby providing a uniform dispersion of the exfoliated layers within the polymer matrix (6:25-7:49).

Regarding claim 32: Elspass *et al.* the styrene derived units are present in 5.5 wt% (10:49-50).

Regarding claim 38: Elspass *et al.* teaches the clay, layered materials, can be modified with swelling agents (exfoliated) via alkylammonium salts (2:33-63).

Regarding claim 40: Elspass *et al.* teaches the clay {layered material} is in an amount of 0.1 to 80 wt% of the nanocomposite (3:3-7).

Regarding claim 42: Elspass *et al.* teaches carbon black (4:50-51).

Regarding claim 45: Elspass *et al.* teaches a secondary rubber {polybutadiene rubber} (3:32-46).

Regarding claim 73-74: Elspass *et al.* teaches a tire inner liner (2:1-3; 3:29-31) and innertube [instant claim 74] (3:29-31; 12:21-26).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 5, 9-11, 14, 16, 19, 20, 22-23, 29-32, 36-38, 40, 42, 45, and 73-74 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 5-6, 8, 10-11, 13, 16, 19-20, 22-23, 29-30, 32, 34-37, 39, 42, 45 of copending Application No. 10/518,193. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed compositions and methods substantially

overlap in scope. The instant application utilizes Friedel-Crafts protocol to append functionalized groups (I-V) to the elastomer, whereas '193 use a radical mechanism for modification of the elastomer which results in addition α to the carbonyl. The regioisomers are obvious variants of each other, and the result of each process yields a functionalized elastomer composition having carboxylic groups capable of interacting with exfoliated clay.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

Applicant's arguments with respect to claims 1, 11-12, 22-23, 28, 30-32, 36-38, 40, 42, and 45 have been considered but are moot in view of the new ground(s) of rejection.

Elspass *et al.* (US 5,807,629) teaches layered materials {clay}, which can be modified with swelling agents (exfoliated) via alkylammonium salts (2:33-63). Li *et al.* (US 6,060,549) provides evidence that layered clay materials, when intercalated by treatment with swelling agents, affords a layered silicate that can more readily sorb polymeric material between the layers, thereby providing a uniform dispersion of the exfoliated layers within the polymer matrix (6:25-7:49).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL PEPITONE whose telephone number is (571)270-3299. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo, Ph.D./
Supervisory Patent Examiner, Art Unit 1796
28-Aug-08

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20-August-08